

STATE OF ALASKA

William A. Egan, Governor



Annual Progress Report for

DISTRIBUTION, ABUNDANCE AND NATURAL
HISTORY OF THE ARCTIC GRAYLING IN
THE TANANA RIVER DRAINAGE

by

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ALASKA DEPARTMENT OF FISH AND GAME

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Objectives

1. To determine the effect on growth and survival of Arctic grayling in lakes with various chemical and physical conditions.
2. To investigate interspecific and intraspecific competition in Arctic grayling.
3. To study growth under known conditions.

Grayling fry were stocked in eight waters on June 4, 1970 (Table 12). Bear Lake, FAA Pond, and Sergeant's Pond, all old gravel pits and all containing northern pike, were stocked with 24, 15, and 25 thousand fry, respectively. This was the first stock in Bear Lake and FAA Pond. Sergeant's Pond was unsuccessfully stocked in 1967.

TABLE 12 Lakes Stocked with Grayling Fry on June 4, 1970.

<u>Name</u>	<u>Location</u>	<u>No.</u>	<u>Competing Fish*</u>
Bear Lake	Eielson AFB	25,000	RWF, NP, LCI
Big Lake	Fort Greely	50,000	GR
Clear Rearing Pond	Clear AFB	210,000	None**
Engineer Hill Lake	Eielson AFB	25,000	GR, Ch
FAA Pond	Nenana	15,000	NP, S
Left O. P. Lake	Fort Greely	25,000	GR
Otto's Lake	Healy	50,000	None
Sergeant's Pond	Fort Wainwright	25,000	NP

*NP - Northern Pike

RWF - Round Whitefish

S - Sucker

LCI - Least Cisco

GR - Grayling

Ch - Chubs

**Several rainbow trout gained entry to the pond during the summer, but were removed by late June.

The dissolved oxygen level in Bear Lake dropped to 0.5 ppm by March 25, 1971 (Table 13). FAA Pond retained 4.0 ppm of dissolved oxygen on April 10, 1971. Sergeant's Pond had no measurable oxygen on March 18, 1971.

TABLE 13 Dissolved Oxygen in Grayling Stocked Waters, 1971.

<u>Name</u>	<u>Date</u>	<u>Sample Depth (Ft.)</u>	<u>Oxygen (ppm)</u>	<u>Ice Depth (In.)</u>	<u>Snow Depth (In.)</u>
Bear Lake (north end)	3/25	3	0.5	30	11
(central part)	3/25	3	0.5	30	13
(connected pond)	3/25	3	2.0	30	14
Big Lake	2/ 5	4	1.8	28	8
	2/ 5	5	1.4	28	8
	3/30	4	0.0	34	4
Craig Lake No. 1	2/ 9	6	6.0	26	14
	2/ 9	4	8.0	26	14
	3/24	6	3.4	26	15
Craig Lake No. 2	2/ 9	10	5.0	26	14
	3/24	6	2.2	26	15
Deadman Lake	3/16	6	2.8	26	12
Engineer Hill Lake	3/25	3	0.75	32	16
	3/25	8	Trace	32	16
FAA Pond	4/10	6	4.0	36	14
Left O. P.	2/ 5	6	0.4	29	8
	3/30	4	0.4	30	4
Otto's Lake	4/10	5	1.5	44	2
Sergeant's Pond	3/18	5	0.0	40	30

Left O. P. and Engineer Hill lakes contained grayling from 1967 and 1968 plants, respectively (Table 14). On February 5, 1971, Left O. P. Lake retained only 0.4 ppm dissolved oxygen and on March 25, 1971, Engineer Hill Lake was down to 0.75 ppm dissolved oxygen just under the ice and only a trace at the bottom (depth, 8 feet).

TABLE 14 Sampling of Waters Stocked with Grayling, 1970.

<u>Lake</u>	<u>Lowest Measured D. O. (ppm)</u>	<u>Date</u>	<u>Fish Captured</u>	<u>Date Captured</u>	<u>Length (mm)</u>		<u>Year(s) Stocked</u>
					<u>Range</u>	<u>Mean</u>	
Big Lake	0.0	3/ 5/70	1 GR	6/ 3/70	---	314	1967, 1970
Clear Rearing Pond	-	---	16 GR	6/29/70	35 - 42	38	1970
	-	---	11 GR	7/21/70	54 - 67	62	1970
	-	---	13 GR	11/ 6/70	64 - 80	72	1970
Engineer Hill Lake	4.5	4/ 7/70	90 GR	6/26/70	---	-	1968, 1970
FAA Pond	-	---	1 S	6/11/70	---	-	1970
			2 RWF				
			6 NP				
Independent Lake - No. 8	-	---	9 GR	6/30/70	231 - 298	258	1965
Independent Lake - No. 9	-	---	13 GR	6/30/70	198 - 305	275	1965
Left O. P. Lake	2.5	3/ 5/70	7 GR	6/ 3/70	252 - 272	266	1967, 1970
Otto's Lake	1.0	1/27/70	None	6/11/70	---	-	1967, 1968, 1969, 1970
Sergeant's Pond	-	---	1 NP	7/ 9/70	---	-	1967, 1970
GR - Grayling		RWF - Round Whitefish					
S - Sucker		NP - Northern Pike					

No dissolved oxygen could be found in Big Lake on March 5, 1970, but one 314 mm grayling was caught June 3, 1970, indicating that there must have been oxygen in some part of the lake. Fry were planted in June, 1970. On March 30, 1971, the lake was again tested for oxygen with none measurable.

Utto's Lake, which froze to the bottom over much of its area during the 1969-1970 winter, but had a D. O. at one station of 4 ppm on March 13, 1970, yielded no fish during 24 hours of test netting on June 11, 1970. Fifty thousand fry were introduced June 4, 1970. D. O. on April 10, 1971, was 1.5 ppm at a location with 36 inches of water under the ice.

The large number of fry put into the Clear Rearing pond was to be used for intraspecific competition studies, but problems with the water supply and the accidental entry of several rainbow trout, Salmo gairdneri, resulted in large losses of fry and disruption of the study. The grayling remaining in the pond show signs of severe stunting, e.g., large head and eye, slender body and short length.

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